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RESEARCH REPORT

Comorbid Mental Disorders: Prevalence and Impact on Community Outcomes

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Comorbid Mental Disorders: Prevalence and Impact on Community Outcomes

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Executive Summary

Key words: comorbid mental disorders, offenders, offender mental health, correctional outcomes, mental disorder and criminal behaviour.

The previous research based on the results of the mental health survey looked at the institutional outcomes of men with various combinations of mental health diagnoses (Stewart & Wilton, 2014). Results indicated that the majority of men with a mental disorder have more than one type of diagnosis. Problematic behaviour in the institutions including transfers to segregation and misconducts were more frequent among offenders with a substance misuse disorder (SUD) and/or personality disorders (PD). Offenders with an Axis I disorder only (without SUD or PD) were no more likely to be involved in misconducts, to be instigators in assault related incidents, or to be transferred to segregation than offenders with no diagnosed mental disorder. The authors concluded that it is the symptoms of impulsivity, aggression, and emotional lability associated with personality disorders that largely drive the negative institutional outcomes for many offenders with a mental disorder.

The current research used similar methodology using the results of the mental health survey to examine whether this pattern holds for the revocation outcomes of offenders released from custody.

Results confirmed the findings of the previous research indicating that federally-sentenced men with mental health diagnoses (Axis 1) that combine concurrent diagnoses for substance use disorders and personality disorders had the poorest outcomes and the highest rates of functional impairment of the groups examined. Offenders with an Axis 1 disorder in the absence of comorbid disorders had similar rates of revocations as offenders with no disorders. These results were upheld when factors related to correctional outcomes were controlled.

Previous research internationally has produced conflicting results on the role of mental disorder risk for general criminal offending. The current study provides strong evidence that it is largely the symptoms of impulsivity and emotional instability of individuals with personality disorders in combination with substance misuse problems that contribute to the higher level of criminality among individuals with a mental disorder. This is consistent with research demonstrating that a diagnosis among offenders with a mental disorder in the absence of a personality disorder or a substance misuse disorder these problems does not increase recidivism. A possible exception to this could be under circumstances in which the positive symptoms of a serious mental illness are active. Failure to take into account the role of comorbidity may explain the inconsistency in research related to mental disorder and criminality.

From a policy point of view these results point to the need for offenders with mental disorders to be provided with interventions that directly target criminogenic need factors (Andrews & Bonta, 2010) in addition to treating their serious mental health problems. Addressing the mental health problems in the absence of assessing and addressing features of impulsivity, emotional reactivity and antisocial orientation is unlikely to improve correctional outcomes of mentally disordered offenders in the criminal justice system.

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Introduction

There has been a long debate over the role that mental disorder plays in increasing risk for criminal behaviour and violence. Advocates, concerned for the stigma suffered by those with mental disorders, have frequently claimed that those with disorders are no more likely to be a danger than those without a diagnosis and there is a research base that provides support for this claim (e.g., Bonta, Blais, &Wilson, 2013; Bonta, Law, & Hanson, 1998). Recent international research, however, points to an association between a diagnosis for a mental disorder and criminal behaviour, violent crime in particular (Fazel, Gulati, Linsell, Geddes, & Grann, 2009; Fazel, Langstrom, Hjern, Grann, & Lichenstein, 2009).

The Correctional Service of Canada (CSC) has conducted several studies examining the outcome of offenders with a mental disorder (Wilton & Stewart, 2012). Two studies, relying on file evidence of a diagnosis of a mental disorder, compared the outcomes of four groups of offenders: those with a mental disorder only, those with a substance misuse disorder only, those with a concurrent substance misuse and mental disorder, and those with neither a mental disorder nor a substance misuse disorder. One of these studies focussed on sex offenders only (Wilton, Stewart, & Mossière, 2014). Results of both studies demonstrated that the concurrent disorders group had the poorest outcomes both with respect to institutional behaviour and recidivism on release. The group with a substance misuse disorder had rates of returns to custody higher than offenders in the group without a disorder and the group with a mental disorder only.

Recent research has used the results of a Correctional Service of Canada (CSC) national mental health survey (N = 1,108; Beaudette, Power, & Stewart, 2015) to determine prevalence rates of comorbid mental disorders among incoming federal male offenders and to examine outcomes associated with patterns of comorbidity during their incarceration (Stewart & Wilton, 2015; 2017). The term comorbid diagnosis describes a condition in which a person is diagnosed concurrently with more than one mental health disorder. Overall, these results indicated that most male offenders with mental disorders suffered from at least one other disorder (about 70%); most commonly the mental disorder is combined with either a substance misuse disorder or a personality disorder. The study examined the institutional outcomes of men with various combinations of mental health diagnoses. Results indicated problematic behaviour in the institutions including transfers to segregation and misconducts were more frequent among

offenders with a substance misuse disorder (SUD) and/or personality disorders (PD). Offenders with an Axis I disorder only (without SUD or PD) were no more likely to be involved in misconducts, to be instigators in assault related incidents, or to be transferred to segregation than offenders with no diagnosed mental disorder. The authors concluded that the symptoms of impulsivity, aggression, and emotional lability associated with personality disorders largely drive the negative institutional outcomes for many offenders with a mental disorder. The results have implications for the treatment and management of offenders with mental disorder, pointing to the need for correctional program interventions in conjunction with mental health treatment to stabilise offenders within correctional facilities.

The current research used similar methodology to examine whether this same pattern of outcomes holds for offenders once they are released from custody by comparing the outcomes for offenders in each of the identified comorbidity combinations and offenders with no mental health diagnosis on their rates of revocation and their rates of revocation with an offence.

Method

Note that most of the following method section describing the tools and the approach to mental health diagnosis has been copied from the previous report on the same sample examining the offenders' institutional outcomes (Stewart & Wilton, 2017: *Comorbid Mental Disorders: Prevalence and Impact on Institutional Outcomes*, R- 379). The descriptions of the analyses and outcome variables, however, are unique to this study and this report.

Participants

Clinical interviews were conducted with a cohort of newly admitted federally sentenced men between March 2012 and September 2014. Release and return to custody data were collected in January 2017. Of the 1,108 men interviewed, 975 were released on parole or statutory release and available for examination of their outcomes after release. Of the remaining 133, 114 had not yet been released, and 19 did not have any follow-up time following release because of releases at warrant expiry, court orders of freedom or other jurisdiction, deaths, or transfers to foreign countries. Only those providing their consent were included in this study. The national consent rate was 78%. To determine the representativeness of the sample, the profiles of study participants were compared to the refusers. Participants were more likely to be lower risk (as assessed by criminogenic need and static risk) and to be convicted of a sexual offence ($\chi^2 = 9.18$, $df = 1$, $p < .01$). There was no difference in the mean age between the participants and decliners (35.6 years vs. 35.2 years).

Table 1 presents descriptive statistics for the sample of the men who had been assessed and subsequently released disaggregated by Indigenous ancestry.

Table 1

Descriptive statistics on the sample (N=975).

	Non-Indigenous (*N* = 772)		Indigenous (*N* = 195)		All Men (*N* = 975)	
	n	%	n	%	n	%
Static Risk						
Low	155	20%	11	6%	168	17%
Medium	340	44%	86	44%	432	44%
High	276	36%	98	50%	374	38%
Dynamic Risk (Need Level)						
Low	98	13%	9	5%	109	11%
Medium	324	42%	55	28%	382	39%
High	349	45%	131	67%	483	50%
GAF bands						
21-30	31	4%	8	4%	39	4%
31-40	50	6%	27	14%	77	8%
41-50	85	11%	37	19%	125	13%
51-60	69	9%	29	15%	99	10%
61-70	95	12%	27	14%	122	13%
71-80	146	19%	25	13%	173	18%
81+	296	38%	42	22%	340	35%
Correctional Programs						
Not enrolled	362	47%	32	16%	400	41%
At least 1 Completed	410	91%	163	96%	575	92%
Current Offence						
Violent	356	46%	111	57%	470	48%
Non-violent	416	54%	84	43%	505	52%
	M	*SD*	*M*	*SD*	*M*	*SD*
Age at admission	36	12	32	10	35	12
Sentence Length (days)	1,241	593	1,125	477	1,215	572
Follow-up after release (days)	396	248	268	178	370	241
GAF Scores	70	19	61	19	68	19

Note: GAF = Global Assessment of Function, a lower GAF score indicated more impairment.

Procedure/Analytic Approach

The study employed a continuous intake methodology, meaning that all eligible offenders were approached to participate in the order in which they were admitted to the institution over a six-month period. Due to logistical difficulties and lower than usual admission rates in some regions, data collection exceeded six months in some regions if a larger sample size was required. All interviews that comprise the data for the study were conducted between March 2012 and September 2014. Results were disaggregated by indigenous ancestry where the

numbers allow for meaningful analysis. For this study, the number of offenders in other ethnic groups was too small for analysis by sub-group.

Assessor training. Research Assistants (RAs) were hired to work at the reception centres in each of CSC's five regions (i.e., Atlantic, Quebec, Ontario, Prairies, and Pacific regions) and trained on the administration of the SCID-I and SCID-II. Assessor training was comprised of five days of self-directed learning using the training materials provided by the authors of the SCID (i.e., two user's manuals, two written case examples, eight instructional DVDs). Upon completion of the training, a session with the first author was held to discuss any issues or questions that arose and to practice cases to ensure consistency. In instances where the RAs were unsure of a rating, they would consult the SCID manual and with the first author before coming to a consensus. Coding decisions were shared with all RAs.

Participant recruitment. All incoming offenders on new warrants of committal were recruited at the reception units on a continuous basis. Offenders who were admitted because of revocations, breaches, or suspensions of a previous release were not included. It should be noted that a small percentage of offenders who would have met the referral criteria were not approached to participate for various reasons (e.g., they were immediately placed in segregation, were receiving treatment in hospital, were assessed as a security risk, or were a high-profile offender[1]). Their information was documented and notes were taken indicating the reason the interview was not conducted. If an offender was approached and declined for personal reasons, the RA documented the reason. All interviews were conducted in a private room to ensure confidentiality. If an offender had been violent with staff or displayed behaviours that were considered unsafe, the interview was postponed or cancelled.

Informed consent and data management. No compensation or incentive was provided to participants. A verbal summary of the informed consent form was provided to the participant, followed by an opportunity to ask questions about the procedure and the consent form. A hardcopy of the signed informed consent form was required for the interview to proceed. A debriefing form was given to the participant following the completion of the interview. All interviews were conducted in English or in French. As the structured interview was used for research, not diagnostic purposes, results were not shared with participants. In the event an

[1] Had received media coverage and were placed in protective custody.

offender stated that he was concerned about his mental health or the RA felt the offender required follow-up services, he was referred to the psychology department at the institution.

After the interview was completed, data were entered into an electronic spreadsheet in a protected file on a secure network and the hardcopy SCIDs were locked in a cabinet in a secure room at the institution. Offender names were kept separate from their participant numbers as a measure to further protect their identity. As a quality control measure, data on the electronic spreadsheet were periodically compared to the results recorded on the hardcopy SCID files.

Measures/Material

Structured Clinical Interview for DSM Axis I Disorders (SCID-I). The SCID-I is a semi-structured interview designed to determine major DSM-IV Axis I diagnoses (First et al., 1995). The Research Version of the SCID, which was used here, is considerably longer than the Clinician Version given it is designed to include most of the information that is diagnostically useful to researchers. Compared to the Clinician Version, the Research Version contains more disorders, subtypes, severity, longitudinal disorder course trajectories, and provisions for coding the specific details of past mood episodes, allowing the researcher to modify the interview to fit the specific needs of a particular study (biometric). The following Axis I disorders were assessed for this study: (1) mood; (2) psychotic; (3) substance use; (4) anxiety; and (5) eating. Pathological gambling was also including from the optional model. The SCID-I is widely considered to be the "gold standard" for assessing psychiatric diagnoses (e.g., Shear et al., 2000; Steiner, Tebes, Sledge, & Walker, 1995), and has been used with men and women in the community, as well as psychiatric and offender samples (Fennig, Craig, Lavelle, Kovasznay, & Bromet, 1994; Steadman, Robbins, Islam & Osher, 2007; Trestman, Ford, Zhang, & Wiesbrock, 2007; Zanarini & Frankenburg, 2001; Zanarini et al., 2000).

Research suggests that the reliability for the SCID-I is good to excellent for most modules (Lobbestael, Leurgans, & Arntz, 2010; Segal, Kabacoff, Hersen, Van Hasselt, & Ryan, 1995; Skre, Onstad, Torgersen, & Kringlen, 1991; Williams et al., 1992; Zanarini & Frankenburg, 2001; Zanarini et al., 2000). Its validity is also good to excellent, with the SCID-I comparing favourably to diagnoses made by psychiatrists in terms of sensitivity, specificity, and agreement (Fennig et al., 1994).

Structured Clinical Interview for DSM Axis II Personality Disorders (SCID-II). The SCID-II is a semi-structured interview developed for the assessment of DSM Axis II Personality

Disorders (First et al., 1995). It is considered the "gold standard" in assessing personality disorders, and has been used with offenders (Guy, Poythress, Douglas, Skeem, & Edens, 2008; Komarovskaya, Loper, & Warren, 2007; Ullrich et al., 2008). Only the portions of the SCID-II that assess BPD and Antisocial Personality Disorder (APD) were administered in this study.

Reliability is reported as excellent for the assessment of borderline personality disorder (BPD) (Zanarini & Frankenburg, 2001) and the inter-rater reliability of the BPD and antisocial personality disorder (APD) assessments of the SCID-II is also good to excellent (Dreessen & Arntz, 1998; First et al., 1995; Fogelson, Neuchterlein, Asarnow, Subotnik, & Talovic, 1991; Lobbestael et al., 2010; Maffei et al., 1997). Compared to other measures and psychiatric diagnoses, it has good sensitivity (0.74 – 0.84), specificity (0.82) and convergent validity (r = 0.80) in men and women psychiatric patients (Grilo et al., 2001; Ryder, Costa, & Bagby, 2007; Skodol, Rosnick, Kellman, Oldham, & Hyler, 1988). A study that compared the SCID diagnoses to longitudinal diagnoses found strong validity for the APD module for male psychiatric patient, with an agreement at 0.95 diagnostic power (Skodol et al., 1988).

Modified Global Assessment of Functioning – Revised (GAF). The GAF is included in the DSM-IV-TR as the measurement for Axis V and is the most widely used measure of global functioning in psychiatric patients (Bodlund, Kullgren, Ekselius, Lindstrom, & von Knorring, 1994; Piersma & Boes, 1997). The scale measures global severity of psychiatric illness by considering a patient's social, psychological, and occupational functioning. The modified GAF with its detailed criteria and more structured scoring system provides better interclass correlations than the original GAF (Hall, 1995). Ratings are associated with the following levels of function due the impact of symptoms:

81-90 absence of symptoms
71-80 some transient mild symptoms
61-70 some persistent mild symptoms
51-60 moderate symptoms
41-50 some serious impairment
31-40 major impairment
21-30 inability to function
0-20 danger to self and others

The descriptors for each 5-10-point bracket make the distinction between criteria easier for raters for this version of the GAF. Although limited research on the reliability and validity of the revised tool has been conducted, the GAF has been used by the World Health Organization

(WHO) to estimate degree of impairment across their large scale international studies (WHO, 2004) and is regarded as a useful tool that can be easily administered with little training or clinical expertise. While the psychometrics of the tool in clinical settings have been criticised, excellent reliability and validity are reported with more structured assessment protocols such as the SCID and with brief training of raters (Bates, Lyons, & Shaw, 2002; Vatnaland, Vatnaland, Friis, & Opjordsmoen, 2007).

Profiling information. Demographic information, static risk factors ratings, dynamic risk factors ratings, transfers to treatment centres and information on participation in correctional programs were extracted from the Offender Management System (OMS), CSC's official electronic record of offenders. Criminal risk variables were drawn from the Offender Intake Assessment (OIA), which is a comprehensive evaluation conducted on all incoming federal offenders. One component of the OIA, the static risk factor, rates offenders as low, moderate, or high based on consideration of previous youth and adult court offences, the current offence, the number, type and severity of the offences, crime-free periods, and sexual offences (Correctional Service of Canada, 2014). The Dynamic Factors Identification and Analysis (DFIA) component of the OIA assesses seven domains of dynamic criminogenic risk factors. Each domain consists of multiple indicators (Brown, & Motiuk, 2005; Stewart, Wardrop, Wilton, Thompson, Derkzen, & Motiuk, 2017). The seven domains are: employment and education, marital and family, associates and social interaction, criminal attitudes and values, personal and emotional orientation, substance misuse, and community functioning. The five-point rating scale for each domain includes asset to community adjustment, no immediate need for improvement, low, moderate and high need for improvement for five of the domains; two domains, substance misuse and personal/emotional do not have an option for the asset rating. Ratings of moderate or high need for improvement were combined to indicate a need in each of the dynamic factor domains. In addition, a final assessment provides an overall rating of low, moderate or high dynamic risk (Correctional Service of Canada, 2015).

Release outcomes

Data on outcomes on release were drawn from the OMS. Outcomes were restricted to offenders who had been given a parole or statutory release and failure on release was restricted to first revocations of conditional release for any reason and a return to federal custody. For most

analyses, there were too few events to analyse returns to custody with an offence separately by comorbidity group, but they are included in the general measure of returns to custody.

Analyses.

Using three major categories of disorders assessed during the SCID interviews (i.e., substance use disorders (SUD), all Axis I disorders, and personality disorders (PD)), eight mutually exclusive comorbidity patterns were identified. Offenders with any of the 23 current mood, psychotic, anxiety and eating disorders assessed were counted as having an Axis I disorder. Offenders with a current alcohol misuse or dependence or drug misuse or dependence disorder were determined to have a substance use disorder. Due to the prevalence of substance use disorders and their importance in correctional outcomes, they constituted their own category separate from other Axis I disorders. Offenders assessed as having antisocial personality disorder (APD) or borderline personality disorder (BPD) were described as having a personality disorder (PD). The presence of these three types of disorders determined offenders' placement into one of the eight comorbid categories. Analyses examined the strength of association between comorbidity groups and revocations and revocations with an offence by comparing percentages and Cox regression. Cox regression analysis was used to support the analyses of the frequencies of revocations. This type of analysis ensured that the patterns among the percentages of revocations were not due to variable time at risk. Hazard ratios, Harrell's C areas under the curve were measures of strength of association. A Harrell's C of .5 indicates no association. Cox regression was also used to determine the strongest associations between revocations and factors including comorbidity groups, age, static and dynamic risk, GAF scores, correctional program completion, and admissions to treatment centres. Dynamic risk was measured by counting the number of DFIA-R domains with moderate or high need, excluding the substance misuse and personal/emotional domains.

Results

Seventy-two percent of offenders who were in the released sample suffered from a substance use, other Axis I mental disorder, or personality disorder. Of these, 64% had at least one other type of disorder. (For a full list of the various pattern of diagnosis and comorbidities and their prevalence in the federal male offender population please see Stewart and Wilton, 2017).

Table 2 below shows the associations between comorbidity groups and revocation for any reason. Overall, 298 men out of 975 (30.6%) had revocations of their parole or statutory releases. Revocations with an offence (30 out of 975) were too rare for meaningful comparisons across the groups. For non-Indigenous men, the group with a concurrent diagnosis for all three types of disorders – substance use, Axis 1 MD and PD – had the highest proportion of revocations. Offenders with a PD only were the next most likely to have a revocation. Whether the PD co-occurred with substance use or any other mental disorder (Axis 1 MD) or occurred alone appeared to have little influence in the differences in rates of revocations.

Although the rates of revocations of Indigenous men were greater than for non-Indigenous men, there were too few Indigenous men in the sample to discern a reliable association between revocations and comorbidity patterns (Wald χ^2 (7, N = 195) = 4.6, p = .711, Harrell's C = .56).

Table 2

Revocations associated with comorbidity groups

Comorbidity Group	Non-Indigenous Men (N = 772)		All Men (N = 975)	
Revocations for any reason	%	HR	%	HR
1. Substance use & Axis I & PD	42%	4.03***	47%	4.06***
2. Substance use & Axis I (no PD)	24%	1.80 [ns]	33%	2.29**
3. Substance use & any PD (no Axis I)	28%	2.31***	38%	2.88***
4. Axis I & PD (no SUD)	31%	2.73***	33%	2.46***
5. Substance use (no Axis I & no PD)	27%	2.08*	36%	2.67***
6. Axis I only (no PD, no SUD)	11%	0.80 [ns]	15%	0.91[ns]
7. PD only (no SUD no Axis I)	28%	2.24**	30%	2.09**
8. No Disorder (PD, SUD or Axis I) [a]	15%	-	17%	-
Wald χ^2 (df)	49.6*** (7) [b]		69.5*** (7) [d]	
Harrell's C	.65		.64	

Note : SUD = Substance Use Disorder; MD = All other Axis I disorders, PD=Personality Disorder (Antisocial or Borderline)

[ns] non-significant, * p < .05, ** p < .01, *** p < .001

[a] Reference group

[b] The proportional hazards test is non-significant, meaning that the hazard ratios associated with comorbidity groups for non-Indigenous men does not fluctuate over time (Wald χ^2 (1, N = 772) = 0.02, p = .887).

[c] Test not run as no significant relationships were detected.

[d] The proportional hazards test is non-significant, meaning that the hazard ratio associated with CM8group for all males does not fluctuate over time (Wald χ^2 (1, N = 975) < .01, p = .992).

The association between revocations and GAF scores was also examined. GAF scores provide a well-validated assessment of the degree of impairment and level of function. Non-Indigenous and Indigenous men with revocations and those with revocations with an offence generally had lower GAF scores on average than those without revocations. However, the results for Indigenous men were not statistically significant. The hazard ratios from Cox regression analyses support these results. The hazard of revocations and revocations with an offence among men in general decline by about 2 and 3 percent, respectively, with each 1 point increase in GAF score.

Table 3

Revocations associated with Global Assessment of Functioning (GAF) mean scores

Group	Revoked			Not Revoked					
	M	SD	n	M	SD	n	χ^2	HR	Harrell's C
Non-Indigenous	64.6	20.1	188	71.1	18.5	584	24.6	0.98***	.60
Indigenous	60.5	19.5	107	61.2	19.3	88	1.4	0.99^{ns}	.54
All Men	63.1	19.2	298	69.8	18.9	677	38.0	0.98***	.61
	Revoked with an Offence			Not Revoked with an Offence					
Non-Indigenous	67.3	20.2	18	69.6	19.1	754	1.4	0.99^{ns}	.59
Indigenous	50.4	20.3	12	61.5	19.2	183	4.2	0.97^{ns}	.66
All Men	60.6	21.6	30	68.0	19.4	945	8.4	0.97**	.65

^{ns} non-significant, * $p < .05$, ** $p < .01$, *** $p < .001$

Note : The proportional hazards assumption was tested for all significant Cox Regression models above and was met for all models.

HR = Hazard Ratio

Table 4 displays hazard ratios of a Cox regression model in which both the comorbidity groups and GAF scores were entered to predict revocations for any reason. The model was non-significant for Indigenous men (Wald χ^2 (8, N = 195) = 5.0, p = .758, Harrell's C = .56), possibly due to the smaller cohort size and small numbers in some diagnosis group. The groups of non-Indigenous men with a) comorbid SUD, MD and PD, b) comorbid SUD and PD, c) comorbid MD and PD, d) SUD alone, and e) PD alone were all significantly more likely to have a revocation than non-Indigenous men with none of the disorders. Revocations with an offence were too rare to test models which included more covariates.

Table 4

Revocations associated with comorbidity groups and GAF scores

Comorbidity Group and GAF (continuous score)	Non-Indigenous Men (N = 772)	All Men (N = 975)
1. Substance use & Axis I & PD	3.238***	3.182***
2. Substance use & Axis I (no PD)	1.572[ns]	1.967*
3. Substance use & any PD (no Axis I)	2.094**	2.549***
4. Axis I & PD (no SUD)	2.322**	2.034*
5. Substance use (no Axis I & no PD)	1.962*	2.480***
6. Axis I only (no PD, no SUD)	0.727[ns]	.814[ns]
7. PD only (no SUD no Axis I)	2.078*	1.915*
GAF	.993[ns]	.993*
Model Fit		
Wald χ^2	51.984***(8)[b]	74.2307***(8)[d]
Harrell's C	.65	.65

Note : PD=Personality Disorder (Antisocial or Borderline); GAF= Global Assessment of Function

[ns] non-significant, * $p < .05$, ** $p < .01$, *** $p < .001$

[a] The group with no disorders was the reference group and is therefore not shown.

[b] The proportional hazards test is non-significant, meaning that the hazard ratio associated with GAF score for NI males does not fluctuate over time Wald χ^2 (2, N = 772) = .548, p = .760

[c] The proportional hazards assumption was not tested as model not significant.

[d] The proportional hazards test is non-significant, meaning that the hazard ratios do not fluctuate across time Wald χ^2 (2, N = 975) = 0.006, p = .997

To test whether the results could have been due to group differences in common revocations correlates, a model including age at release, static and dynamic risk level, correctional intervention completion and mental health treatment centre transfers were added to a Cox regression model. Table 5 shows the results of this model. For the model with all men, age at release and dynamic risk level were the most reliable correlates of revocations. However, offenders with comorbid SUD, MD and PD, offenders with comorbid SUD and PD, and offenders with SUD alone were more likely to have a revocation than those with no disorders, after controlling for covariates. Similarly, non-Indigenous men with comorbid SUD, MD and PD

and those with comorbid MD and PD were more likely to have a revocation than those with none of the disorders after controlling for the other covariates. Indigenous men in the various comorbidity groups were not significantly more likely to have a revocation compared to Indigenous men without any of the disorder. Although the model for Indigenous men was statistically significant (Wald χ^2 (14, N = 195) = 25.2, $p = .032$, Harrell's C = .65), only age at release was a reliable predictor of revocations (HR = .957, $p < .001$). However, this non-significant result could be due to the small size of the cohort of Indigenous men and the number of covariates in the model.

Table 5

Revocations associated with comorbidity groups and GAF scores

Covariates	Non-Indigenous Men (N = 771)	All Men (N = 974)
1. Substance use & Axis I & PD	1.934*	1.879**
2. Substance use & Axis I (no PD)	1.318 ns	1.661 ns
3. Substance use & any PD (no Axis I)	1.404 ns	1.676*
4. Axis I & PD (no SUD)	1.896*	1.601 ns
5. Substance use (no Axis I & no PD)	1.515 ns	1.918**
6. Axis I only (no PD, no SUD)	.828 ns	.921 ns
7. PD only (no SUD no Axis I)	1.674 ns	1.454
GAF	.996 ns	.997 ns
Age at Release	.967***	.963***
Static Risk – High	1.470 ns	1.574*
Static Risk – Medium	1.087 ns	1.171 ns
Dynamic Risk level	1.274***	1.214***
At least 1 complete low, moderate or high intensity correctional program	1.294 ns	1.480**
Any admission to TC	1.218 ns	1.423 ns
Model Fit		
Wald χ^2	97.817***(14)	147.938***(14)
Harrell's C	0.71	0.71

ns non-significant, * p < .05, ** p < .01, *** p < .001

Note : TC=Treatment Centre; LMH=low, medium or high intensity; SUD = Substance Use Disorder; MD = All other Axis I disorders, PD=Personality Disorder (Antisocial or Borderline); GAF= Global Assessment of Function

Discussion

Results confirm previous research indicating that federally-sentenced men with mental health diagnoses (Axis 1) that combine concurrent diagnoses for substance misuse disorders and personality disorders had the poorest outcomes and the highest rates of functional impairment. The poorer release outcome for offenders in this group is consistent with conclusions reached based on research on the impact of mental disorders on this same sample with respect to their institutional outcomes. Offenders with an Axis 1 disorder in the absence of comorbid mental health disorders did not do more poorly than offenders with no disorder. It should be noted, however, that the majority (about 70%) of released offenders with one type of disorder will meet criteria for at least one other type.

Previous research internationally has produced conflicting results on the role of mental disorders in the risk for general criminal offending. The current study suggests that it is largely the symptoms of impulsivity and emotional instability symptomatic of individuals with personality disorders in combination with substance misuse problems that contribute to the higher level of criminality among individuals with a mental disorder. A diagnosis in the absence of these problems does not increase recidivism or explain violent behaviour. An exception to this may be in circumstances where the positive symptoms of a serious mental illness are active. Failure to take into account the role of comorbidity may explain the inconsistency in research related to mental disorder and criminality (Joyal, Cote, Meloche, & Hodgins, 2011).

Research is pointing to the likelihood that antisocial behaviours and symptoms of many mental disorders are associated with varying degrees of neurological impairment that may have share similar genetic underpinnings (Baker, Bezdjian, & Raine, 2006; Blair, 2003; Cross-Disorder Group of the Psychiatric Genomics Consortium, 2013; Moffitt, 2005; Mukherjee, 2016; Serretti, & Fabbri, 2013; Silva, 2007) that involve executive processing deficits compromising an individual's ability to self-regulate, avoid self-defeating behaviours, and attain prosocial goals (Morgan & Lilienfeld, 2000).

Conclusion

From a policy point of view these results point to the need for most federal offenders with mental disorders to be provided with interventions that directly target criminogenic need factors (Andrews & Bonta, 2010) in addition to treating their serious mental health problems. Addressing the mental health problems in the absence of assessing and addressing features of impulsivity, emotional reactivity and antisocial orientation is unlikely to improve correctional outcomes of mentally disordered offenders in the criminal justice system.

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